

SN:09/540,578

having been deposited under ATCC Accession No. PTA-4346, with a second maize plant to yield progeny maize seed;

- (b) growing said progeny maize seed, under plant growth conditions, to yield said PH3AV-derived maize plant.

41. (Amended) A PH3AV-derived maize plant, or parts thereof, produced by the method of claim 40.

42. (Twice Amended) The method of claim 40, further comprising:

- (c) crossing said PH3AV-derived maize plant with itself [or another maize] plant to yield additional PH3AV-derived progeny maize seed;
- (d) growing said progeny maize seed of step (c) under plant growth conditions, to yield additional PH3AV-derived maize plants;
- (e) repeating the crossing and growing steps of (c) and (d) to generate further PH3AV-derived maize plants.

43. (Amended) The further PH3AV-derived maize plants, or parts thereof, produced by the method of claim 42.

47. (Amended) The maize plant, or parts thereof, of claim 21, further comprising a single gene conversion.

48. (Amended) The maize plant of claim 47, wherein the single gene conversion is a dominant allele.

49. (Amended) The maize plant of claim 47, wherein the single gene conversion is a recessive allele.

#### REMARKS

Claims 45 and 46 have been cancelled. Claims 1-44, and 47-49 are now pending in the application. Claims 1, 3, 4, 5, 6, 8, 11, 12, 13, 14, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27, 30, 31, 32, 33, 35, 36, 37, 40, 41, 42, 43, 47, 48, and 49 have been

SN:09/540,578

amended. No new matter has been added by amendment. Reexamination and reconsideration of the claims as amended are respectfully requested.

#### CLAIM OBJECTIONS

5.) In the office action dated March 27, 2002, the Examiner rejects claims 1-49 under the "doctrine of obviousness-type double patenting as being unpatentable over claims 1-27 of U.S. Patent No. 6,124,534 (534')." Applicant traverses the rejection. Examiner states, " Although the conflicting claims are not identical, they are not patentably distinct from each other because they both appear to be drawn to the same maize seeds, plants, plant parts and methods. The designation 'PH3AV' of the instantly claimed seed is arbitrarily assigned, and does not provide any patentable distinction from the cultivar claimed in '534, PH1K2, which is also arbitrarily assigned. Any differences between PH3AV and PH1K2 and plants derived from them are due to minor morphological variations that do not confer patentable distinction." The Examiner goes on to state, " Inserting the ATCC accession number into the instant claims will overcome the rejection." Applicant points out that the designation "PH3AV" of the instantly claimed cultivar is not arbitrarily assigned. PH3AV seed has been deposited with the ATCC and the specification and the appropriate claims have been amended to include the ATCC deposit number. The amendments obviate the rejection.

#### REJECTIONS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

6.) Examiner rejects claims 1-49 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Examiner states that, "Claims 1-49 are incomplete in the recitation of the limitation 'representative seed having been deposited under ATCC accession number \_\_\_\_\_' as set forth in claims 1, 6, 21, 25, 37, and 40." Claims 1, 6, 21, 25, 37, and 40 have been amended by deleting the blank spaces and inserting the ATCC deposit number. The specification has also been amended to include the terms of the deposit for PH3AV. A copy of the ATCC deposit receipt is included in this response. These actions obviate the rejection.

7.) Examiner states that, "Claims 19, 20, 35, 48, and 49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and

SN:09/540,578

distinctly claim the subject matter which applicant regards as the invention. Claims 19, 20, 48, and 49 are improperly dependent on their parent claims. The claims are directed to maize plants." Claims 18, 19, 20, 47, 48, and 49 have all been amended as suggested by the Examiner to have proper dependency.

The Examiner goes on to state that, "In claim 35: The claim is improperly dependent on claim 34. Claim 35 is directed to the maize plant breeding program of claim 34. However, claim 34 is directed to a method." Claims 16 and 35 have been amended by deleting, "maize plant breeding program" and inserting "method". The amendments obviate the rejection.

#### **REJECTIONS UNDER 35 U.S.C. § 112, FIRST PARAGRAPH**

8.) Examiner states, "Claims 3-5, 14, 17, 22-24, 33, 36, 41, 43, 45, and 46 are rejected under 35U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant traverses this rejection.

The Examiner categorically rejects product claims encompassing any modification of PH3AV, no matter how minor the modification or routine the modification is for a breeder of ordinary skill in the art to make.

As noted in the specification, the development of an inbred line is a time consuming and labor intensive activity. On average, between 10,000 to 20,000 lines are screened in order to develop any maize inbred line for which Applicant files a patent application. Once developed, the inbred line is useful for two purposes: (1) to make commercial hybrids, and (2) as a source of breeding material for the development of new inbreds that retain its desired characteristics. A breeder desiring to make a line with similar traits to PH3AV would be greatly advantaged by being able to use PH3AV as starting material. This is because the linked genes arranged through Applicant's breeding efforts, and fixed in PH3AV, can be maintained in the progeny of PH3AV by a breeder of ordinary skill in the art. For example, if a breeder of ordinary skill in the art desired an early maturity version of PH3AV, the breeder could cross PH3AV to an earlier maturing variety, select for progeny with at least two desired PH3AV traits that also express early maturity, and continue selecting for the traits of PH3AV combined with early maturity. Optionally, the breeder to could backcross to PH3AV to obtain further genetic contribution from PH3AV. The end result is the development of an

SN:09/540,578

inbred line with substantially all of the benefit of Applicant's work but with only a fraction of the effort.

Specifically, in rejecting the claims for lack of written description, the Examiner states, "The specification also does not describe the plants that can be produced by the corn breeding programs, or by crosses wherein at least one ancestor is the corn variety PH3AV and expresses a combination of any 2 of the traits listed in the claims, or a plant having all of the physiological and morphological characteristics of corn variety PH3AV. The description of PH3AV is not indicative of the description of plants produced by the breeding programs of crosses, as other corn plants, of unknown genotypes and phenotypes, would be crossed with PH3AV and its progeny. The claimed invention encompasses plants that express at least two traits derived from another plant, is not sufficient information to describe that plant, as numerous corn plants express at least two of the same traits as PH3AV. Two plant traits do not provide any description of the other traits. Therefore, to say that a plant expresses two PH3AV traits is not an indication that it was derived from PH3AV, and it is not sufficient description of that plant. Further, it is possible that the claimed plants inherited the genes governing those traits from an ancestor other than PH3AV. For, example, Kramer (U.S. Patent No. 6,124,534) describes a corn plant, designated 'PH1K2,' which has at least two traits in common with PH3AV, for example high grain yield, early flowering, and high silage yield (col. 11, lines 1-7). The instantly claimed corn plants could have PH1K2 as an ancestor, as well as PH3AV in which these three traits, for example, could have been inherited from PH1K2. Furtherstill, the claims also encompass plants that do not have to express any of the traits of such plants, and in the description of the phenotype of PH3AV is not indicative of the description of such plants."

Applicant notes that Examiner's comments represent an abrupt and undocumented change of patent office policy. In numerous previous cases involving the protection of germplasm and progeny claims, including cases allowed after the recently adopted written description guidelines, the listing of traits was previously required by the patent office as a way to meet the written description requirement with respect to progeny. One reason for using traits as a means of description is because it was, and still is, technologically impossible to sequence the entire genome of a specific variety.

Imagining for a moment that it was possible to sequence the genome of a variety, PH3AV could be described and compared to the prior art to identify its unique genetic sequences and sequence combinations, and presumably, claims to progeny

SN:09/540,578

retaining those unique genetic aspects would be allowed by the patent office. This would be analagous to the way claims are examined for individual short genetic sequences and claims allowed for any plant comprising a specific transgene. Applicant asserts that the fact that technological tools do not exist to fully describe the unique characteristics of the full genome of PH3AV does not make the progeny lines derived therefrom any less entitled to adequate patent protection. It is the purpose of the patent law to protect new and useful processes, compositions of matter and improvements thereof. 35USC 101. Rather than deny the patentability of subject matter, should the patent office now view traits as an unacceptable means of description, other means of description used by those of ordinary skill in the art may be used to satisfy written description.

This situation is somewhat analagous to *Ex Parte Tanksley*, 37 USPQ2d. 1382. In that case the Examiner desired that Tanksley claim according to sequence data to "better characterize the cDNA clones" and "facilitate a complete search of the prior art" and issued a 112 first paragraph written description rejection. The Board held that "the section 112 rejection amounts to a requirement...that the appellants amend their claims in a specified manner...We find no language in the statute or case law which would support that requirement." The Board, in treating the section 112 first paragraph rejection as a 112 second paragraph rejection, held that "In our judgement, a patent applicant is entitled to a reasonable degree of latitude in complying with the second paragraph of 35 U.S.C. 112 and the examiner may not dictate the literal terms of the claims for the stated purpose of facilitating a search of the prior art. Stated another way, a patent applicant must comply with 35 U.S.C. 112, second paragraph, but just how the applicant does so, within reason, is within applicant's discretion." *Id.* at 1386.

Applicant has amended claims 17, 33 and 36 to limit the progeny covered to those within two outcrosses from PH3AV. Claim 41 is limited to one outcross from PH3AV by virtue of dependency. Within the plant breeding arts breeders use pedigree as a means to characterize lines in reference to their progenitors. To those of ordinary skill in the art, this indicates that a line that is fewer crosses away from a starting line will be, as a whole, more highly related to the starting line. Thus, the work of the original breeder in developing the starting line will be retained in the closely related progeny. More specifically, traits and linkage groups present in PH3AV will be retained in progeny that are within 2 outcrosses from PH3AV. Applicant submits that characterization of the progeny of PH3AV by virtue of their filial relationship is clearly within reason. Not only

SN:09/540,578

are filial descriptions used by breeders to evaluate materials for use in their breeding programs, but it is standard practice within the plant breeding industry for licensor's of inbred maize lines to retain a royalty from lines developed through the use of their inbreds. Those royalties are, in almost all cases, based on the filial relationship between the licensed inbred used in breeding and the progeny line commercialized.

Applicant also notes that the mere fact that the progeny have not been created does not prevent them from being patented. As stated in MPEP 2163 (3) (a), "An invention may be complete and ready for patenting before it has actually been reduced to practice." As stated in the written description guidelines "an applicant shows possession of the claimed invention by describing the claimed invention with all its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. Possession may be shown in a variety of ways, including...by describing distinguishing identifying characteristics sufficient to show that the applicant was in possession of the claimed invention." (emphasis added). 1255 Official Gazette 140 (Feb. 5, 2002). Pedigree, which is a formula used by plant breeders, is a distinguishing identifying characteristic in compliance with the written description guidelines. Further, the Examiner must evaluate written description by the claimed invention with all of its limitations, including the limitation of being derived from PH3AV.

PH3AV-derived progeny are described by the fact that PH3AV is utilized in a breeding program to make the PH3AV-derived progeny, PH3AV gives genetic contribution to the PH3AV-derived progeny, and the genetics of PH3AV are described by ATCC deposit of PH3AV seed. By limiting the progeny to 2 or less outcrosses, the Examiner's concern that the progeny may be only distantly related to PH3AV is addressed. In *Enzo vs. Gen-Probe*, U.S. State Court of Appeals for the Federal Circuit, rehearing decided 7/12/02, the court reversed its prior decision regarding the insufficiency of the deposited genetic probes to meet the written description requirement. In so holding, the court stated, "As the deposited sequences are about 850, 8500, and 1300 nucleotides long, ..., there are at least hundreds of subsequences of the deposited sequences, an unknown number of which might also meet the claimed hybridization ratio. Moreover, Enzo's expert, Dr. Wetmur, stated that 'astronomical' numbers of mutated variations of the deposited sequence also fall within the scope of those claims, and that such broad claim scope is necessary to adequately protect Enzo's invention from copyists who could otherwise make minor change to the

SN:09/540,578

sequence and thereby avoid infringement while still exploiting the benefits of Enzo's invention. The defendants assert that such breadth is fatal to the adequacy of the written description. On the other hand, because the deposited sequences are described by virtue of a reference to their having been deposited, it may well be that various subsequences, mutations, and mixtures of those sequences are also described to one of skill in the art. We regard that question as an issue of fact...."

The issue of whether the progeny as now claimed satisfies the written description requirement is also an issue of fact. One of ordinary skill in the art would know if PH3AV were utilized in a breeding program by looking at the breeding records and therefore would know if a progeny were derived from PH3AV. PH3AV is a unique inbred, as evidenced by the morphological and physiological traits given in Table 1, pages 17-19, of the application. Routinely used molecular techniques as discussed on page 15, line 8, through page 16, line 2, of the Application can be used to verify whether PH3AV is within the pedigree of a line.

Applicant would also like to emphasize that PH3AV cannot be derived through any other means than through PH3AV seed and plant, nor can the influence of PH3AV on the progeny be removed from a line within 2 outcrosses of PH3AV. As stated in the application on page 7, lines 3-5, "A breeder of ordinary skill in the art would also be unable to recreate the same line twice from the very same original parents...." And it therefore follows that if PH3AV is utilized as a parent to derive progeny then the derived progeny within 2 outcrosses could not be obtained by any means other than the use of PH3AV seed or plant. This fact also highlights the different perspective between the Examiner and the Applicant regarding the scope of the claims. The Examiner believes the claims to progeny to be of great breadth. However, to view these claims as being of great breadth merely because a large number of plants could theoretically fall within its scope ignores an essential limitation of the claim; that only a plant developed through the use of PH3AV is within the scope of the claim. Such a plant could not be independently derived without the use of PH3AV, so the claim would not in any way restrict the work of a breeder that did not in fact use PH3AV. Compliance with the written description requirement is essentially a fact based inquiry that will "necessarily vary depending on the nature of the invention claimed." *Vas-Cath v. Mahurkar*, 935 F.2d 1555 (citing *In re DiLeone*, 436 F.2d 1404, 1405). Thus, the compliance with the written description requirement must be judged in view of this limited scope of the progeny claims. As amended, the claims are drawn to only a limited scope of progeny,

SN:09/540,578

progeny which but for Applicant's creation of PH3AV could never have existed. This is in harmony with the statement in section 2163 of the MPEP that "the written description requirement promotes the progress of the useful arts by ensuring inventions are adequately described in the specification in exchange for the right to exclude." That quid pro quo of patent law has been met by the Applicant in the present case, and to use written description to deny adequate patent protection would be contrary to the stated purpose of the written description requirement.

Applicant points out that, to overcome the Examiner's rejection, claim 14 has been amended in a different manner. The Examiner has expressed concern that the PH3AV traits retained by the progeny may be derived from the non-PH3AV side of the pedigree. To address this concern, Applicant has amended claim 14 to specify that at least two PH3AV traits were derived from PH3AV and not from other plants utilized in the development of said maize plant.

In addition to the progeny claims, the Examiner issued additional written description rejections as follows: "It is well known that chromosome aberrations can be a side effect of tissue culture techniques, which introduce new characteristics into the tissue culture and in plant regenerated therefrom. The specification does not describe the characteristics of such cultures and plants. It is suggested that claims 4 and 23 be amended to indicate that the regenerable cells of the tissue culture regenerate a plant that expresses all of the morphological and physiological characteristics of corn variety PH3AV." Applicant points out that claims 4 and 23 have been amended to delete the words "of regenerable" and now read, "A tissue culture of cells from the from the plant of claim 2 [21]." These amendments obviate the rejection.

The Examiner also stated, "It is suggested that claim 3 be amended to indicate that the corn plant of claim 2 is further manipulated to be male sterile." Claims 3 and 22 have been amended as suggested by the Examiner thus obviating the rejection. Support for this amendment, including a description of methods of manipulation to obtain male sterility, are found on page 2, lines 1-4, of the specification.

In light of the amendments to the claims and the foregoing arguments the Applicant requests reconsideration of the rejection under the first paragraph of 35 U.S.C. 112.

#### **REJECTIONS UNDER 35 U.S.C. § 102 and 103**



SN:09/540.578

9.) Examiner states that, "Claims 1-49 are rejected under 35 U.S.C. 102(e) as anticipated by or in the alternative, under 35U.S.C. 103(a) as obvious over Kramer (U.S. Patent No. 6,124,534).

The Examiner goes on to state, "Kramer teaches seed of maize inbred line PH1K2, plants produced by growing said seed, and plants and plant parts having all the physiological and morphological characteristics of inbred line PH1K2 (col. 10, line 59 to col. 13, line 50; claims). It appears that the claimed plants and seeds of the instant invention may be the same as PH1K2, given that each has red cob color, red anther color, red silk color, high grains yields, early flowering, and high silage yield, for example (Table 1; col. 11, lines 1-7). Alternatively, if the claimed plants, plant parts, and seeds of PH3AV are not identical to PH1K2, then it appears that PH1K2 only differs from the claimed plants, plant parts, and seeds due to minor morphological variation, wherein said minor morphological variation would be expected to occur in different progeny of the same cultivar, and wherein said minor morphological variation would not confer patentable distinction to PH3AV.... Amending claims 1, 6, 21, 25, 37, and 40 to include the ATCC accession number will overcome the rejection for claims 1-13, 15, 16, 18-32, 34, 37-40, 42, 44, and 47-49." Claims 1, 6, 21, 25, 37, and 40 have been so amended thus obviating the rejection to claims 1-13, 15, 16, 18-32, 34, 37-40, 42, 44, and 47-49 under 35 U.S.C. 102(e) and 35 U.S.C. 103(a).

The Examiner also states that, "... even with the inclusion of the ATCC number, the plants of claims 14, 17, 33, 36, 41, 43, 45, and 46 are still taught by Kramer, as the claims broadly encompass maize plants that can express any trait, or as inbred line PH1K2 has at least two traits of PH3AV listed in the claims. The process of making the claimed plants does not distinguish the plants themselves from those taught by the reference. Thus, the claimed invention was clearly prime facie obvious as a whole to one of ordinary skill in the art, if not anticipated by Kramer."

Applicant traverses the rejection to claims 14, 17, 33, 36, 41, 43, 45, and 46 under 35 U.S.C. 102(e) and 35 U.S.C. 103(a). Applicant would first like to point out that PH3AV is not PH1K2, nor is PH3AV an obvious variation or anticipated variation of PH1K2. Differences are taken from Table 1, on pages 17-19 of the specification and Table 1 of the Kramer patent, columns 11-13 and are listed in the following table.

PH3AV	PH1K2
91 days from emergence to 50% plants in silk	67 days from emergence to 50% plants in silk

SN 09/540,578

92 days from emergence to 50% plants in pollen	66 days from emergence to 50% plants in pollen
182 cm = plant height	160 cm = plant height
77 cm = ear height	70 cm = ear height
6 = Northern leaf blight rating	3 = Northern leaf blight rating
1 = Stay green rating	5 = Stay green rating
4,534 Kg/ha yield	6,225 Kg/ha yield

The examples and the list are not exhaustive but they give ample evidence that the inventions are not the same. Nor are they minor variations of each other.

Applicant has cancelled claims 45, and 46.

Applicant has amended claim 14 to read, "A maize plant, or parts thereof, wherein at least one ancestor of said maize plant is the maize plant of claim 2, said maize plant expressing a combination of at least two PH3AV traits which are not significantly different from PH3AV traits when determined at the 5% significance level and when grown in the same environmental conditions, said PH3AV traits selected from the group consisting of: a relative maturity of 84 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, flowering, ear mold tolerance, early growth, grain yield, silage yield, silage quality, starch content of silage, and energy content of silage, and wherein said at least two PH3AV traits were derived from PH3AV and not from other plants utilized in the development of said maize plant." Applicant points out that claim 14 has been amended to clearly define the traits of PH3AV that could be found in a maize plant produced from PH3AV. Applicant has amended the claim using the term "not significantly different from PH3AV traits when determined at a 5% significance level..." as a definitive term. In the specification pages 37-41, the tables show mean trait values. The standards against which the listed traits should be compared are the mean values for those traits exhibited by PH3AV or a maize plant produced from PH3AV in a side-by-side comparison or other similar environmental conditions. For example, on page 35 lines 1-6 of the specification it discusses that PH3AV demonstrates significantly earlier flowering when compared to PHR25. The Applicant would also like to point out that one of ordinary skill in the art of plant breeding would know how to evaluate the traits of two inbred maize lines to determine if they are not significantly different to a 5% significance level in the expression of a given trait. On pages 275-276 in Principles of Cultivar Development (1987) Fehr writes "Two or more independent comparisons of lines in a test provide a means of estimating whether variation in performance among lines is due to differences in genetic potential or to

SN:09/540.578

environmental variation." A copy of Fehr, pages 261-286, is attached to this Amendment and Request for Reconsideration as Appendix A. As was done by the Applicant in the specification, mean trait values would be used to determine whether the trait differences are significant. Further, the claims, as amended, require that the traits be measured on plants grown in the same environmental conditions.

The claim also clearly states that PH3AV is utilized to obtain the maize plant claimed. Because PH3AV is not PH1K2 nor is PH3AV obvious over PH1K2 then any plant derived through the use of PH3AV is non-obvious. Also of importance is that because PH3AV is not PH1K2 the maize plant of claim 14 cannot be obtained by any means other than by utilizing the seed or plant of PH3AV. Applicant requests that the Examiner reconsider the rejection to claim 14 under 35 U.S.C. 102(e) and 35 U.S.C. 103(a).

Applicant has amended claims 17 and 36 as follows, "A maize plant, or parts thereof, produced by the method of claim 15 (34) wherein the method comprises 2 or less crosses to a plant other than PH3AV or itself." Claims 17 and 36, as well as claim 33, are now limited to a maize plant two crosses away from PH3AV. The MPEP section 2143.03 states, "If an independent claim is non-obvious under 35 USC 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q. 2d 1596 (Fed. Cir. 1988)." The MPEP section 2116.01 states, "All the limitations of a claim must be considered when weighing the differences between the claimed invention and the prior art in determining the obviousness of a process or method claim." Once again, because PH3AV is not PH1K2 nor is PH3AV obvious over PH1K2 then any plant derived through the use of PH3AV is non-obvious. Also of importance is that progeny of PH3AV cannot be obtained by any means other than by utilizing the seed or plant of PH3AV.

Applicant has amended claims 41, 42, and 43. Claim 41 has been amended and now reads, "A PH3AV-derived maize plant, or parts thereof, produced by the method of claim 40." Claim 41 is now one cross away from PH3AV. Claim 41 clearly states that PH3AV must be used to obtain a PH3AV-derived maize plant. Claim 42 has been amended so that it does not allow any further crosses away from PH3AV. Thus claim 42 is the selfing of the plant derived by the one cross away from PH3AV made in claim 40. Claim 43 has been amended for clarification purposes. All PH3AV-derived plants are limited to one cross away from PH3AV and the derived plants are limited by the use of PH3AV in the initial cross. One would not be able to obtain plants within one cross of

SN:09/540,578

PH3AV through modification of the maize inbred taught by Kramer because PH3AV comprises a unique and nonobvious combination of genetics. Plants derived from PH3AV retain unique and nonobvious combinations of genetics derived from PH3AV. Thus, they deserve to be considered new and nonobvious compositions in their own right.

In light of the above, Applicant respectfully requests the Examiner reconsider and withdraw the rejection to claims 1-49 under 35 U.S.C. 103(a).

Cancellation of claims 45 and 46 and amendment of claims 1, 3, 5, 6, 14, 16, 19, 20, 21, 22, 24, 25, 33, 35, 37, 40, 41, 42, 43, 48, and 49 does not in any way change the claim scope which the Applicant believes is allowable but is meant to hasten the issuance of the patent.

#### CONCLUSION

Attached hereto is a marked-up version of the changes made to the specification and claims by current amendment. The attached page is captioned "**VERSION WITH MARKINGS TO SHOW CHANGES MADE**".

Applicant submits that in light of the foregoing amendments and the remarks, the claims 1-44, and 47-49 are in condition for allowance. Reconsideration and early notice of allowability is respectfully requested. If it is felt that it would aid in prosecution, the Examiner is invited to contact the undersigned at the number indicated to discuss any outstanding issues.

Respectfully submitted,  
Hartwig Wehrmann



Steven Callistein  
Reg. No. 43,525  
Attorney for Applicant

Steven Callistein  
Pioneer Hi-Bred International  
7100 NW 62<sup>nd</sup> Avenue  
P.O. Box 1000  
Johnston, IA 50131-1000  
(515) 254-2823  
(515) 224-6883 Facsimile

SN:09/540,578

**VERSION WITH MARKINGS TO SHOW CHANGES MADE****In the specification**

On page 43, lines 2-21 have been deleted and the clean paragraph as written was inserted.

**In the claims**

Claims 45 and 46 were deleted.

Claims 1, 3, 5, 6, 14, 16, 19, 20, 21, 22, 24, 25, 33, 35, 37, 40, 41, 42, 43, 48, and 49 were amended as follows:

1. (Amended) Seed of maize inbred line designated PH3AV, representative seed of said line having been deposited under ATCC Accession No. [ \_\_\_\_\_ ] PTA-4346.
3. (Amended) The maize plant of claim 2, wherein said plant is manipulated to be male sterile.
4. (Amended) A tissue culture [of regenerable cells] from the plant of claim 2.
5. (Amended) A tissue culture according to claim 4, [the] cells or protoplasts of the tissue culture being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.
6. (Amended) A maize plant regenerated from the tissue culture of claim 4, capable of expressing all the morphological and physiological characteristics of inbred line PH3AV, representative seed of which have been deposited under ATCC Accession No. [ \_\_\_\_\_ ] PTA-4346.
8. (Amended) The method of claim 7 wherein [the inbred maize plant of claim 2] said different inbred parent maize plant is the female [or male] parent.
11. (Amended) The maize plant, or parts thereof, of claim 2, wherein the plant, or parts thereof, [have been transformed so that its genetic material contains one or more

SN:09/540,578

transgenes operably linked to one or more regulatory elements] further comprises a transgene.

12. (Amended) A method for producing a maize plant [that contains in its genetic material one or more transgenes,] comprising crossing the maize plant of claim 11 with [either] a second plant of another maize line [, or a non-transformed maize plant of the line PH3AV, so that the genetic material of the progeny that result from the cross contains the transgene(s) operably linked to a regulatory element].

13. (Amended) [Maize plants] The maize plant, or parts thereof, produced by the method of claim 12.

14. (Amended) A maize plant, or parts thereof, wherein at least one ancestor of said maize plant is the maize plant of claim 2, said maize plant expressing a combination of at least two PH3AV traits which are not significantly different from PH3AV traits when determined at the 5% significance level and when grown in the same environmental conditions, said PH3AV traits selected from the group consisting of: a relative maturity of [approximately] 84 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, [early] flowering, [good seed quality, good] ear mold tolerance, [good stalks, very good plant health, hard kernel texture, good] early growth, [high] grain yield, [high] silage yield, [high] silage quality, [high] starch content of silage, and [high] energy content of silage, [early maturing for silage, slow drying for grain and adapted to the Northwest region of the United States, Western Canada and Northern Europe]; and wherein said at least two PH3AV traits were derived from PH3AV and not from other plants utilized in the development of said maize plant.

16. (Amended)The [maize plant breeding program] method of claim 15 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

17. (Amended) A maize plant, or parts thereof, produced by the method of claim 15 wherein the method comprises 2 or less crosses to a plant other than PH3AV or itself.

SN:09/540,578

18. (Amended) The maize [plants] plant, or parts thereof, of claim 2, further comprising [one or more] a single gene [conversions] conversion.

19. (Amended) The [single gene conversion(s)] maize plant of claim 18, wherein the single gene conversion is a dominant allele.

20. (Amended) The [single gene conversion(s)] maize plant of claim 18, wherein the single gene conversion is a recessive allele.

21. (Amended) A maize plant, or parts thereof, having all the physiological and morphological characteristics of inbred line PH3AV, representative seed of said line having been deposited under ATCC accession No. [ \_\_\_\_\_ ] PTA-4346.

22. (Amended) The maize plant of claim 21, wherein said plant is manipulated to be male sterile.

23. (Amended) A tissue culture [of regenerable] cells from the plant of claim 21.

24. (Amended) A tissue culture according to claim 23, [the] cells or protoplasts of the tissue culture being from a tissue selected from the group consisting of leaves, pollen, embryos, roots, root tips, anthers, silks, flowers, kernels, ears, cobs, husks, and stalks.

25. (Amended) A maize plant regenerated from the tissue culture of claim 23, capable of expressing all the morphological and physiological characteristics of inbred line PH3AV, representative seed of which have been deposited under ATCC Accession No. [ \_\_\_\_\_ ] PTA-4346.

27.(Amended) The method of claim 26 wherein [the inbred maize plant of claim 21] said different inbred parent maize plant is the female [or male] parent.

30. (Amended)The maize plant, or parts thereof, of claim 21, wherein the plant, or parts thereof, [have been transformed so that its genetic material contains one or more transgenes operably linked to one or more regulatory elements] further comprises a transgene.

SN:09/540 578

31. (Amended) A method for producing a maize plant [that contains in its genetic material one or more transgenes,] comprising crossing the maize plant of claim 30 with [either] a second plant of another maize line [, or a non-transformed maize plant of the line PH3AV, so that the genetic material of the progeny that result from the cross contains the transgene(s) operably linked to a regulatory element].

32. (Amended) [Maize plants] The maize plant, or parts thereof, produced by the method of claim 31.

33. (Twice Amended) A PH3AV-derived maize plant, or parts thereof, wherein at least one ancestor of said PH3AV-derived maize plant is the maize plant of claim 2[21], and wherein the pedigree of said PH3AV-derived maize plant is within 2 or less crosses to a plant other than PH3AV or itself. [said PH3AV-derived maize plant expressing a combination of at least two PH3AV traits selected from the group consisting of: a relative maturity of approximately 84 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, early flowering, good seed quality, good ear mold tolerance, good stalks, very good plant health, hard kernel texture, good early growth, high grain yield, high silage yield, high silage quality, high starch content of silage, high energy content of silage, early maturing for silage, slow drying for grain and adapted to the Northwest region of the United States, Western Canada and Northern Europe.]

35. (Amended) The [maize plant breeding program] method of claim 34 wherein plant breeding techniques are selected from the group consisting of: recurrent selection, backcrossing, pedigree breeding, restriction fragment length polymorphism enhanced selection, genetic marker enhanced selection, and transformation.

36. (Amended) A maize plant, or parts thereof, produced by the method of claim 34 wherein the method comprises 2 or less crosses to a plant other than PH3AV or itself.

37. (Twice Amended) A process for producing inbred PH3AV, representative seed of which have been deposited under ATCC Accession No. [ \_\_\_\_\_ ] PTA-4346, comprising:



SN.09/540 578

- (a) planting a collection of seed comprising seed of a hybrid, one of whose parents is inbred PH3AV said collection also comprising seed of said inbred;
- (b) growing plants from said collection of seed;
- (c) identifying inbred parent plants;
- (d) selecting said inbred parent plant;
- (f) controlling pollination through selfing, which preserves the homozygosity of said inbred parent plant; and
- (f) collecting morphological and/or physiological data so that said inbred parent may be identified as inbred PH3AV.

40. (Amended) A method for producing a PH3AV-derived maize plant, comprising:

- (a) crossing inbred maize line PH3AV, representative seed of said line having been deposited under ATCC Accession No. [ \_\_\_\_\_ ] PTA-4346, with a second maize plant to yield progeny maize seed;
- (b) growing said progeny maize seed, under plant growth conditions, to yield said PH3AV-derived maize plant.

41. (Amended) A PH3AV-derived maize plant, or parts thereof, produced by the method of claim 40[, said PH3AV-derived maize plant expressing a combination of at least two PH3AV traits selected from the group consisting of : a relative maturity of approximately 84 based on the Comparative Relative Maturity Rating System for harvest moisture of grain, early flowering, good seed quality, good ear mold tolerance, good stalks, very good plant health, hard kernel texture, good early growth, high grain yield, high silage yield, high silage quality, high starch content of silage, high energy content of silage, early maturing for silage, slow drying for grain and adapted to the Northwest region of the United States, Western Canada and Northern Europe].

42. (Twice Amended) The method of claim 40, further comprising:

- (c) crossing said PH3AV-derived maize plant with itself [or another maize] plant to yield additional PH3AV-derived progeny maize seed;
- (d) growing said progeny maize seed of step (c) under plant growth conditions, to yield additional PH3AV-derived maize plants;

SN:09/540.578

- (e) repeating the crossing and growing steps of (c) and (d) [from 0 to 4 times] to generate further PH3AV-derived maize plants [, wherein said further PH3AV-derived maize plants express a trait genetically derived from inbred PH3AV].

43. (Amended) [A] The further [derived maize plant] PH3AV-derived maize plants, or parts thereof, produced by the method of claim 42.

47. (Amended) The maize [plants] plant, or parts thereof, of claim 21, further comprising [one or more] a single gene [conversions] conversion.

48. (Amended) The [single gene conversion(s)] maize plant of claim 47, wherein the single gene conversion is a dominant allele.

49. (Amended) The [single gene conversion(s)] maize plant of claim 47, wherein the single gene conversion is a recessive allele.